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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/749,359

Filing Date: December 30, 2003

Appellant(s): SAUCIUC ET AL.

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Angelo Gaz  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed July 1, 2009 appealing from the Office action mailed June 1, 2009.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be reviewed on Appeal**

The Appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,547,130	Eastmann	10-1985
US 2003/0062149 A1	Goodson et al.	04-2003
US 2003/0205364 A1	Sauciuc et al.	11-2003

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 6, 7, 10-12, 25, and 27-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Goodson et al. US 2003/0062149 A1. Goodson teaches all the limitations as claimed for a method including the steps of: **[claim 6] (a)** orienting a pump or a compressor 300 without regard to a gravitational location (¶ 0176) of a heat source 50 coupled to the pump or compressor 300, **(b)** determining a presence of a threshold amount of a fluid that is within the pump or the compressor 300 (¶0173), **(c)** condensing vapor of the fluid as it is present in the pump 300 or evaporating liquid of the fluid as it is present in the compressor 300 (¶0173); **[claim 7]** the step of checking a sensor coupled to the pump or compressor 300 (¶0177); **[claim 10] (d)** the step of repeating **(b)** and **(c)** until there no longer a threshold amount of the fluid in the pump or compressor 300 (¶0177); **[claim 11] (e)** after **(d)** applying power to the pump or compressor 300 (¶0177); **[claim 12] (f)** applying power to a second heat source 332 coupled to the

pump or compressor 300; **[claim 25]** powering on the pump 300 after condensing, or powering on the compressor 300 after evaporating (¶0173); **[claim 27]** the step of the method wherein fluid is within the pump 300 and the pump is a liquid pump to force liquid through a system 100 (¶0186); **[claim 28]** and the step wherein the fluid is within the compressor 300 and the compressor 300 is a vapor compressor to force vapor through a system 100 (¶0173).

3. Claims 6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Eastman US 4,547,130. Eastman teaches all the limitations as claimed for a method including the steps of: **[claim 6] (a)** orienting a pump 14 or a compressor without regard to a gravitational location (abstract) of a heat source 40 coupled to the pump or compressor 14, **(b)** determining a presence of a threshold amount of a fluid that is within the pump or the compressor 14, **(c)** condensing vapor of the fluid as it is present in the pump 14 or evaporating liquid of the fluid as it is present in the compressor (abstract); **[claim 9]** cooling vapor within a liquid pump 14 to a condensation point by a thermoelectric cooler (col. 3 ll. 36-39).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eastman US 4,547,130 in view of Sauciuc et al. US 2003/0205364. Eastman teaches all the

limitations as claimed for method as discussed but fails to teach the limitations taught by Sauciuc for method including the step of checking a sensor 24 (¶0027) coupled to the pump/compressor 10 wherein condensing comprises cooling vapor within a liquid pump to a condensation point (¶ 0028) and further comprising turning off the sensor 24 (¶ 0027) and a heat source 34, then turning on the pump 10 (0029). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify a method wherein a thermoelectric cooler was used, as taught by Eastman, to include the step of using a sensor, as taught by Sauciuc, in order to continuously in order to dissipate heat from an electronic device (Sauciuc ¶ 002).

#### **(10) Response to Argument**

##### **Response to Section VII.A of the Appeal Brief – Appellant's overview**

###### **Goodson US 2003/0062149 A1**

Appellant's summary of the instant reference does not encompass a significant aspect of the invention and is incorrect on at least one count. Goodson does teach a catalytic recombiner for an electroosmotic pump as discussed by the Appellant, but the Appellant has failed to touch on the fact that Goodson's pump 300 is a high pressure pump (see Goodson - ¶0075, 0097). The primary function/principle operation of the pump 300 is to bring fluid through an inlet 322 to a chamber 312 to be pumped out of an outlet 324 to either a micro heat exchanger 200 (in a preferred embodiment) disposed on a heat source 50, or to a macro heat exchanger 400 (in an alternate embodiment as disclosed by Goodson - ¶0101) through the use of electroosmotic forces (Goodson -

0082). As disclosed pump 300 is a high pressure pump and is not required to be fed by gravity because it utilizes electroosmotic force to pull in fluid (Goodson - ¶0082, 0135).

The recombiner 326 is used to form water from residual oxygen within a pump chamber 312, and hydrogen that has traveled through a coolant loop (Goodson - ¶0083), or been captured in a cathode chamber 312a and directly returned to an anode chamber to be recombined with oxygen (Goodson – 0174). By Appellant's own definition the recombiner could be considered a pump. Per ¶0016 of the instant application a “[p]ump 100, in other embodiments, may be any type of device that forces liquid through a system.” The recombiner forces hydrogen and oxygen gas to be combined and form water, which is then passed into a main pumping chamber and pumped through a coolant loop (Goodson - ¶0142). Therefore the recombiner acts as a pump as it forces hydrogen and oxygen gas through the system by causing the two to combine, condense, and move from recombiner chamber into a pump chamber 312.

The Appellant states “although channels 328 are positioned circumferentially around the pumping structure to allow gas access from the cathode chamber 312a from cathode chamber 312a into chamber 312b, such that hydrogen gas dose not get trapped within chamber 312a when pump 300 is oriented at a tilt with respect to gravity . . .” Appeal, July 7, 2009, page 5. The examiner notes that the Appellant appears to be equating orientating a pump with locating it with respect to gravity. An apparatus's orientation is relative to a frame of reference and is not inherently dependent upon its gravitational location. One of ordinary skill in the art would recognize that if one were to take an apparatus, such as a hermetic compressor or a micro pump used for chemical

experimentation, and place it on a surface such a table right side up, and then rotate the apparatus to lay on its side or 180<sup>0</sup> from its normal operating position, the apparatus would have a different orientation from when it was placed right side up but the same gravitational location because there was no elevation change to the surface it was resting on. Goodson teaches that one embodiment of the pump 300 allows gas access "regardless of the orientation of the pump 300 relative to gravity" (Goodson ¶0176). Here Goodson is being specific regarding a pump's orientation relative to gravity (i.e. elevation) not's it's orientation relative to a longitudinal access as argued by the Appellant.

**Response to VII.B of the Appeal Brief - Arguments with respect to claim 6**

**Appellant's arguments**

In reference to claim 5, the Appellant argues that the Goodson reference "does not disclose 'orienting a pump or compressor without regard to a gravitational location . . .'" Appeal Brief of July 1, 2009, page 7. The Appellant further argues that the examiner's assertion the limitations of claim 6 cannot be taught by a method including the steps of locating a pump independently of a component, and then subsequently locating said component. Appeal Brief of July 1, 2009, page 7.

**Examiner's Response**

The examiner notes that the limitations as claimed to do not specify an order in which a pump or compressor and a heat source must be located. Further a method in which a heat source is relocated after a pump or compressor is set, would not be precluded from reading on the limitations as claimed. Therefore a method in which a

pump or compressor is located without regard to a heat source, includes a subsequent step of locating a heat source depending upon the location of the pump or compressor, meets the limitations as claimed. There is no limitation that requires a heat source to have a pre-existing permanent location, nor is there a step claimed where the heat source is located and then a pump or compressor is located.

There are two ways in which the pump 300 operates without regard to a gravitational location of a heat source. The first being the pump itself and the second being the pumping action of the recombiner. The examiner notes the limitations as claimed recite "orientating a pump or a compressor without regard to a gravitational location of a heat source coupled to the pump or compressor." Similar to the disclosure in Goodson in ¶0176, the Appellant has made a specific reference to a gravitational location of components, not their orientations relative to a particular axis. As such a positive displacement pump with a suction inlet could be located independent of the gravitational location of a reservoir or, in a closed loop system, other components as along as an inlet was connected to a supply. This is because a fluid would be sucked or brought into a pump chamber by the pump's own operation. Likewise with Goodson, aside from the embodiment that is disclosed as being located regardless of orientation relative to gravity, as long as the pump 300 of figure 2 is set upright (and preferably with an outlet pointed towards a micro heat exchanger 200 - Goodson - ¶0198) it will be able to function no matter where the heat source 50 is located. Regardless of whether the high pressure pump 300 is above, below, or level with a heat source, fluid will still be

brought into the pump through electroosmotic force and then pumped by the porous structure (Goodson - ¶0097, 0101 (flexibility with arrangements), and 0108).

Further with respect to the recombiner 326, if the pump is orientated upright then hydrogen gas and oxygen will still bubble up to the recombiner chamber no matter where the heat source 50 is located. The positive displacement pump 300 generates electroosmotic force to bring in fluid to be pumped, it is not gravity fed. As long as the pump brings in fluid and operates the porous structure 310, hydrogen and oxygen gas will be produced and provide a recombiner with what is required to operate as a pump itself (per Appellant's disclosure ¶0016). Goodson further teaches that the pump 300 shown in figure 2, is a high pressure pump that can pump fluid to either or both of a micro 200 and macro 400 heat exchanger. As shown in figure 2 the macro heat exchanger 400 is disposed above a pump 300 and the micro heat exchanger 200 is disposed below it (Goodson - ¶0101). Therefore the electroosmotic pump 300 can pump fluid to a location/apparatus regardless of the gravitational location of the heat source 50 it is coupled to.

**Response to VII.B of the Appeal Brief - Arguments with respect to claim 12**

**Appellant's Argument**

The Appellant argues that Goodson does not teach the limitations of claim 12 as it depends from claims 6, 10, and 11. The Appellant argues that Goodson does not teach applying power to a pump or compressor after there is no longer a threshold amount of fluid in the pump or compressor, and applying power to a second heating source.

Examiner's Response

Goodson teaches a pump 300 which operates to pump fluid that has been returned to a chamber 312 by a recombiner. Given the broadest reasonable interpretation of the limitations as claimed Goodson teaches:

**[Claim 6]**

**(a)** providing a pump or compressor 300 independent of gravitational location of a heat source

**Ex.** - As discussed above.

**(b)** determining a presence of a threshold amount of a fluid that is within the pump or the compressor 300

**Ex.** - The threshold amount of fluid would be the amount of hydrogen and oxygen gas required to form water.

**(c)** condensing vapor of the fluid as it is present in the pump 300 or evaporating liquid of the fluid as it is present in the compressor 300

**Ex.** - This occurs automatically because of the catalyst of the recombiner 326 combines the two gases and condenses them to form water.

**[Claim 10]**

**(d)** the step of repeating **(b)** and **(c)** until there no longer a threshold amount of the fluid in the pump or compressor 300

**Ex.** - This again occurs automatically because the recombiner will always produce water as long as the catalyst does not need to be rejuvenated; the recombiner "combines" continuously and will stop when the supply

fluids, hydrogen and oxygen gas, are no longer present within the recombiner chamber and therefore not present in the pump chamber 312.

**[Claim 11]**

**(e) after (d) applying power to the pump or compressor 300**

**Ex. -** This is accomplished by the porous pumping structure 310 of the pump 300 which may or may not have already been operating, however Goodson teaches that once hydrogen and oxygen are combined and produce water then the water is pumped by pump 300 (Goodson – ¶0082).

**[Claim 12]**

**(f) applying power to a second heat source 332 coupled to the pump or compressor 300;**

**Ex. –** The examiner notes that Goodson teaches that turning on a heater 332 to restore the performance of a catalyst, selectively occurs when there is a pressure increase indicating a recombiner is wet (see Goodson ¶0142, 0173, 0177). There is no limitation that requires a heat source to be triggered by a particular event besides the completion of applying power to a compressor or pump. As discussed about this occurs automatically and thus so does the operation of heater 332. When a condition is sensed then the heater 332 operates. This would always occur after power was supplied to a pump because if power was not supplied to the pump there would not be fluid flowing through a pump

producing bi-products that were recombined in to water. Therefore since Goodson teaches all the steps as they occur, the process of turning on a heater could on occur after a pump was turned on.

**Response to VII.B of the Appeal Brief - Arguments with respect to claim 28**

Appellant's Argument

The Appellant argues that Goodson teaches against having gas bubbles or vapor within cooling lines. The Appellant focuses their argument on the embodiment disclosed in ¶0173 and cited by the examiner, in which Goodson teaches "[o]ne option is to simply let the gas escape from the system along with the pumped fluid." However the Appellant goes on to argue that Goodson teaches away from this method because it is not a preferred method for handling the hydrogen gas.

Examiner's Response

The examiner disagrees and notes that with respect to the embodiment of Fig. 2, Goodson teaches hydrogen gas generated in a cathode passing through a coolant loop and returning to a pump 300 where it is recombined with oxygen (Goodson - ¶0082). The examiner notes that the law of anticipation does not require that the reference teach what the Appellant is claiming but only that the claims on appeal "read on" something disclosed in the reference. See *Kalman v. Kimberly Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). Here Goodson does teach what the Appellant claims and states that it is an option for design, just not the best option. Regardless of which arrangement Goodson teaches is preferable for a particular embodiment, the

reference teaches that it was known in the art to force vapor through a system as claimed.

**Response to VII.C of the Appeal Brief - Arguments with respect to claim 6**

**Appellant's Argument**

With respect to the rejection of claim 6 under 35 U.S.C. 102(b) as being anticipated by Eastman US 4,547,130 the Appellant argues that Eastman teaches away from orientating without regard to a gravitational location by requiring the absence of gravity.

**Examiner's Response**

The examiner notes that Appellant's statement that "orientating without regard to a gravitational location is a relationship that requires the existence and influence of gravity" is counter intuitive. If one's objective was to arrange one piece of equipment without regard for the gravitational location for another piece of equipment, the best method for doing that would be to avoid the effects of gravitational forces. The language of "without regard" presents a vague negative limitation with a broad scope. Eastman is a representative example of how broad the claimed limitations of claim 6 are and the range of types of prior art that read on the instant invention. As noted above this limitation does not require a heat source to have a pre-existing permanent location nor does it strictly limit the method to include a sequence of steps in which a pump or compressor is located after a heat source is located. The limitations merely require a pump or compressor to essentially be located, the fact that the gravitational location of another element, or that the other element has a gravitational location, is irrelevant for

purposes of the claimed limitations because the only component that is being affected by the step claimed is the pump or the compressor.

**Response to VII.D of the Appeal Brief - Arguments with respect to claim 26**

**Appellant's Argument**

With respect to the rejection of claims 26 under 35 U.S.C. 103(a) as being anticipated by Eastman US 4,547,130 in view of Sauciuc et al. US 2003/0205364 the Appellant argues that the cited references do not describe the claim limitations or the benefits of overcoming the problems generally associated with the orientation of pumps or compressors.

**Examiner's Response**

In response to Appellant's arguments, 37 CFR 1.111(b) states, "A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section." Appellant has failed to specifically point out how the language of the claims patentably distinguishes them from the references.

The examiner notes that the Appellant appears to infer that the argument presented with respect to the rejection of claim 6 under 35 U.S.C. 102(b) as being anticipated by Eastman US 4,547,130 applies to its use in a rejection of claim 26 under 103(a). The arguments directed toward the rejection of claim 6 are not persuasive; subsequently the rejection of claim 26 has been maintained. Further the examiner notes with respect to benefits of the instant invention all benefits of claimed invention

need not be explicitly disclosed in reference to render claim unpatentable under 35 USC 103. See *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990). Since the claimed subject matter would have been obvious from the references, it is immaterial that the references do not state the problem or advantage ascribed by Appellant. See *In re Wiseman*, 201 USPQ 658.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,  
/Leonard J Weinstein/  
Examiner, Art Unit 3746

Conferees:  
/Devon C Kramer/  
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